solutions are two-phase systems in which the dispersed phase has a negative charge. Probably hydroxyl ions are absorbed on the particles and attract sodium ions to form double layers which cause higher concentrations of alkali at the interfaces than elsewhere in the solution. This hypothesis explains discrepancies between the results from various methods.

*Compression evaporation: A new method of concentrating liquids developed in Europe recently:* GUSTAV CARLSSON.

*Action of lime on greensand:* R. NORRIS SHREVE. The Eastern Potash Corporation has under construction at New Brunswick, N. J., a large plant for obtaining caustic potash and other potash compounds from greensand. The main reaction in the process is the action of lime in decomposing greensand whereby caustic potash is liberated and a valuable residue obtained, which possesses considerable cementitious properties. In the reaction the lime attacks the greensand, or rather the glauconite contained therein, when heated with the greensand in the presence of water and at elevated temperatures and under sufficient pressure to keep the water in the liquid phase.

*A modification of the acetate method for estimating iron and albumen in phosphates:* F. P. VEITCH and H. P. HOLMAN. As a result of cooperative work with the fertilizer division of the American Chemical Society and also independent investigations, certain modifications have been made in the acetate method for estimating iron and aluminum in the presence of lime and phosphoric acid. This method, in substantially its present form, was submitted by the authors to the committee on research and analytical methods of the fertilizer division and was published as a part of that committee's report on phosphate rock in *Journal of Industrial and Engineering Chemistry*, 7, pp. 446–448. The present article made further modifications as a result of subsequent work, discussed the reasons for the conditions described as necessary for accurate results by this method, and gave results obtained on solutions of known compositions.

*The water resistance of treated canvas during continuous exposure to weather:* F. P. VEITCH and T. D. JARRELL. This paper gives a detailed report on the water resistance of gray 12 oz. U. S. standard army duck, which had been treated with eighteen formulas developed in the Bureau of Chemistry. The degree of water resistance was determined in the laboratory by modified funnel and modified spray methods and also in actual service by exposure to weather for 14 months. General conclusions are drawn as to the effectiveness of the various treatments. The treatments which have proved most serviceable by exposure test have also given high results by the funnel test. However, not all treatments showing a high rating by the funnel test have proven highly serviceable in those cases where water lay for some time on the canvas.

*The detection and estimation of coal tar oils in turpentine:* V. E. GROTLISCH and W. C. SMITH. The method outlined includes the following steps: (1) passing dry hydrogen chloride gas into the liquid, thus converting the pinene into crystalline pinene hydrochloride, also raising the boiling points of the unprecipitated reaction products; (2) distillation of the filtrate under reduced pressure to separate the coal tar oils with a minimum of terpene bodies; (3) sulphonation of the distillate with fuming sulphuric acid, thereby destroying terpenes and converting coal tar hydrocarbons into sulphonic acids; (4) dilution and steam distillation of the sulphonation mixture to remove undecomposed terpenes or mineral oils; (5) direct distillation of the sulphonation mixture to break up the sulphonic acids, with recovery of the coal tar hydrocarbons.

CHARLES L. PARSONS,
*Secretary*

## THE ROYAL SOCIETY OF CANADA

THE following papers were presented before the Mathematical, Physical and Chemical Section of the Royal Society of Canada at the meeting held in Ottawa on May 18, 19 and 20:

Presidential Address.—"Division in relation to the algebraic numbers," by Professor J. C. Fields. "Ionization potential and the size of the atom," by Professor A. S. Eve. "Detection of variation in electric earth currents by coil and galvanometer," by Professor A. S. Eve and Mr. E. S. Biehler. "The effective range of beta-rays," by Miss V. Douglas and Dr. J. A. Gray. "The velocity of sound in air and soil; Properties of x-rays excited by beta-rays; The absorption of gamma-rays; A note on the examination of materials by x-rays," by Dr. J. A. Gray. "The transmission of heat through the thin boundary films of air or of water at the surface of glass," by Dr. A. Norman Shaw and Mr. L. S. Smith.

"The viscosity of ether at low temperatures and solution of acetic acid in liquid hydrogen bromide," by Dr. E. H. Archibald, Mr. C. E. Stone and Mr. E. M. White. "Preliminary report on the lubricating properties of the different series of hydrocarbons," by Dr. W. F. Seyer. "An automatic mercury pump," by Dr. D. F. Steadman. "Some results of the destructive distillation of British Columbia alder and Douglas fir," by Mr. W. A. Hardy. "On the variation of the 'emanating power' of certain uranium minerals with temperature and a new secondary radium emanation standard," by Dr. J. H. L. Johnstone. "The effect of thermo-luminescence on electrical conductivity," by Mr. C. A. Mackay. "The anemometer factor; pilot balloon methods in Canada," by Mr. J. Patterson. "On some new formulæ for the direct numerical calculation of the coefficient of mutual induction of coaxial circles;" "On a new high frequency vibration galvanometer;" "On the photographic recording and measurement of radiotelegraph signals;" "On a new lecture room illustration of atomic models," by Dr. Louis V. King. "On the refractive indices of metallic vapors," by Professor J. C. McLennan. "On the absorption spectrum of liquid and gaseous oxygen," by Mr. W. W. Shaver. "On the structure of the Balmer series lines of hydrogen," by Professor J. C. McLennan and Mr. P. Lowe. "On the spectrum of helium, hydrogen and carbon in the extreme ultraviolet," by Professor J. C. McLennan and Mr. P. A. Petrie. "On the liquefaction of hydrogen," by Professor J. C. McLennan. "Nitrophthalic anhydrides and acetylamino-phthalic anhydrides with toluene and aluminium chlorides," by Mr. W. A. Lawrence. "Bromphthalic anhydrides with benzene and aluminium chloride," by Mr. H. N. Stephens. "The effect of certain chemicals on the rate of reproduction of yeast," by Mr. N. A. Clark. "The passage of hydrogen and of helium through silica tubes," by Professor J. B. Ferguson and Mr. G. A. Williams. "The action of methylgreen on yeast," by Mr. W. B. Leaf. "Pressure-volume relations of superheated liquids," by Mr. K. L. Wismer. "Scattering of light by dust-free liquids," by Mr. W. H. Martin. "Note of Wolski's paper on optically empty liquids," by Professor F. B. Kenrick. "Redetermination of the melting point of sodium chloride," by Professor J. B. Ferguson. "Researches in physical and organic chemistry carried out in the chemical laboratory of the University of Toronto," communicated by Professor W. Lash Miller. "On the reduction of the circulants to polynominal form with applications to the circulants of the 7th and 11th degrees," by Dr. J. C. Glashan. "The gravitation potential of an anchor ring; some tidal problems," by Professor A. H. S. Gillson. "Law of distribution of particles in colloidal solutions," by Professor E. F. Burton and Miss E. S. Bishop. "Production of heat during charcoal absorption," by Mr. Stuart McLean. "The relation between coagulative power of electrolytes and concentration of colloidal solutions," by Professor E. F. Burton and Mr. E. D. MacInnes. "The radial velocities of 570 stars;" "The orbit and dimensions of TV Cassiopeae;" "The temperature control of the stellar spectrograph," by Dr. J. S. Plaskett. "The orbital elements of the brighter components of Boss 497;" "The orbits of spectroscopic components of Boss 4622," by Mr. W. E. Harper. "The intensity distribution in typical stellar spectra," by Mr. H. H. Plaskett. "The solution of plane triangles by nomographic charts," by Dr. S. D. Killam. "Note on the geometrical equivalence of certain invariants," by Dr. Charles T. Sullivan. "The interpolation of breaks in tide curves for recording gauges," by Dr. W. Bell Dawson. "The vertical movement of alkali under irrigation in heavy clay soils;" "Notes on the nature of burn-outs," by Dr. Frank T. Shutt and Miss Alice H. Burwash. "Reversible pendulum," by Professor H. F. Dawes. "Characteristic x-rays from boron," by Professor A. L. Hughes. "A new experiment in vibration," by Professor John Satterly. "Note on the spectra of potassium;" "Note on infra-red spectroscopy," by Professor J. C. McLennan. "Selected radiation emitted by specially excited mercury atoms," by Mr. H. J. C. Ireton.